

L 11517-66 EWT(m)/EWP(j) RM SOURCE CODE: UR/0190/65/007/012/2139/2141  
 ACC NR: AP6001868  
 AUTHORS: Pavlyuchenko, G. M.; Gatovskaya, T. V.; Kargin, V. A. 62  
 ORG: Physico-Chemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut) B  
 TITLE: Influence of the character of supermolecular structures on sorption properties  
 of isotactic polypropylene 44,55  
 SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 12, 1965, 2139-2141  
 TOPIC TAGS: adsorption, sorption, spherulite, polymer, polypropylene plastic, octane,  
 molecular structure  
 ABSTRACT: The effect of supermolecular structure (different size of spherulites) on  
 the sorptive properties of isotactic polypropylene was studied. The sorption of  
 methyl alcohol, n-octane, and n-dodecane on two different specimens of polypropylene  
 was investigated. The specimens consisted of spherulites of 300--350  $\mu$  and 20--30  $\mu$   
 in diameter respectively. The sorption of methanol and n-octane was determined at 25°C,  
 and that of n-dodecane in the region of 100--2000. The results are presented  
 graphically (see Fig. 1). It is suggested that the adsorption effect depends mainly  
 on the spherulite size and occurs only on the outer surfaces of the latter.

UDC: 678.01:53+678.742

Card 1/2

L 11517-66

ACC NR: AP6001868

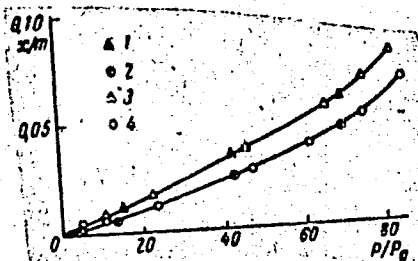


Fig. 1. Sorption isotherms for n-octane on specimens of isotactic polypropylene at 25°C. 1 - small spherulites; 2 - large spherulites; 3, 4 - desorption data.

Orig. art. has: 4 graphs and 1 photograph.

SUB CODE: 11/ SUBM DATE: 27Jan65/ ORIG REF: 004/

OTH REF: 001

Card 2/2

KONSTANTINOPOL'SKAYA, M.B.; KORETSKAYA, T.A.; BERESTNEVA, Z.Ya.;  
KARGIN, V.A.

Structure formation in regular polyamides. Vysokom. soed. 7  
no.11:1927-1929 N '65. (MIRA 19:1)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova. Submitted  
December 16, 1964.

MALKIN, A.Ya.; VINOGRADOV, G.V.; KARGIN, V.A.

Rheology of polymers. Creep of polymers in a molten state.  
Vysokom. soed. 7 no.11:1930-1934 N '65. (MIRA 19:1)

1. Institut neftekhimicheskogo sinteza AN SSSR. Submitted  
December 16, 1964.

DAVYDOVA, S.L.; PLATE, N.A.; YAMPOL'SKAYA, M.A.; KARGIN, V.A.

Chemical modification of chlorinated polyolefins by incorporation of aromatic groups. Vysokom. soed. 7 no.11:1946-1949 N '65.

(MIRA 19:1)

1. Institut neftekhimicheskogo sinteza AN SSSR. Submitted December 25, 1964.

ZHUK, D.S.; GEMBITSKIY, P.A.; KARGIN, V.A.

Advances of polyethylenimine chemistry. Usp. khim. 34 no.7:  
1249-1271 J1 '65. (MIRA 18:7)

1. Institut neftekhimicheskogo sinteza AN SSSR.

VOYUTSKIY, S.S.; KARGIN, V.A., akademik; USTINOVA, Ye T.; SHEPENDING, M.M.

Viscoelastic properties of unwoven textile materials. Dokl. AN SSSR  
160 no.1:172-181 Ja '65. (MIRA 18:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomc-  
nosoza i Tsertral'nyy nauchno-issledovatel'skiy institut khlopchato-  
bumazhnoy promyshlennosti.

BORT, D.N.; OKLADNOV, N.A.; SHTARKMAN, B.P.; VIDYAYKINA, L.I.; KARGIN,  
V.A., akademik

Electron microscope study of structures formed in the polymeri-  
zation of block and suspension polyvinyl chloride. Dokl. AN SSSR  
160 no.2:413-415 Ja '65. (MIRA 18:2)



L 39436-65 EFP(c)/EWP(j)/EWA(c)/EWT(n)/T Pz-4/Pr-4 RM

ACCESSION NR: AP5005889

B/0024/65/160/003/0604/0607

AUTHORS: Kargin, V. A. (Academician AN SSSR); Kabanov, V. A.; Aliyev, K. V.; Razvodovski, Ye. F. 32

TITLE: Specific polymerisation of 4-vinylpyridine salts 31/3

SOURCE: AN SSSR. Doklady, v. 160, no. 3, 1965, 604-607

TOPIC TAGS: pyridine, vinyl, polymerization

ABSTRACT: When 4-vinylpyridine reacts with alkyl halides, instead of monomers of quaternary salts, colorless hygroscopic high-molecular amorphous substances form, soluble in water and in methyl alcohol. These substances do not contain vinyl groups or tertiary pyridine rings, but are typical polyelectrolytes. The complete elemental composition of the high-molecular products from reaction between 4-vinylpyridine and ethyl bromide in various solvents (benzene, acetonitrile, methyl alcohol) at different molar ratios of the components (1:3 to 3:1) corresponds to poly-4-vinylpyridine ethyl bromide (within the limits of analytical error). In excess 4-vinylpyridine, the polymer ceases to form simultaneously with consumption of alkyl halide. Ordinary polymeric inhibitors do not retard this reaction or

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ACCESSION NR: AP5005889

lower the specific gravity. Radical polymerization is thus excluded. The cation mechanism of polymerization is also excluded. All experimental facts point to a specific mechanism that permits the growing chains, by virtue of special behavior of their active centers, to "select" only those monomeric molecules in the reaction system that form salts. This special behavior has to do with polarization of the double bond. The authors describe several experiments in which the reaction is fast, or slow, or absent entirely, and they offer explanations for the results based on the concept of specific features of the active centers. Orig. art. has: 4 figures.

ASSOCIATION: Institut neftekhimicheskogo sinteza im. A. V. Topchiyeva Akademii nauk SSSR (Institute of Petroleum-Chemical Synthesis, Academy of Sciences SSSR)

SUBMITTED: 12Aug64

EWL: 00

SUB CODE: 00, 02

NO REF SOV: 000

OTHER: 001

Card 2/21

L 35448-65 EPF(c)/EPR/ENP(j)/EWT(m)/T Pc-l/Pi-l/Pr-l/Ps-l RPL RM/RWI/WW

ACCESSION NR: AP5006857

S/0920/65/160/004/0857/0860

AUTHOR: Kargin, V. A. (Academician); Kabanov, V. A.; Zubov, V. P.

TITLE: Behavior of macromolecules as individual-phase particles in the presence of a polymerization-depolymerization equilibrium

SOURCE: AN SSSR. Doklady, v. 160, no. 4, 1965, 857-860

TOPIC TAGS: equilibrium constant, polymerization equilibrium, depolymerization equilibrium, monomer, polymer, monophasic system, equilibrium concentration, monomer molecule, macromolecule

ABSTRACT: PDE (polymerization-depolymerization equilibrium) sets in owing to the reversibility of the chain-growth reaction. Generally PDE is described by the combined whole of the equilibria in reversible elementary reactions of the attachment of molecules of a monomer to active polymer chains of different length. It is shown that the PDE constant is determined by the equilibrium concentration (activity) of the monomer and is not directly dependent on the concentration of monomer in the system. The presence of monomer particles in a solution affects only the thermodynamic activity of the monomer. Since the PDE constant is deter-

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L 35448-65

ACCESSION NR: AP5006857

mined only by the activity of the monomer, the chemical potential of the polymer is independent of its concentration in the reaction medium. In other words, even when a polymer is soluble in a reaction system, the PDE is described as heterogeneous. Thermodynamically it is completely analogous to the equilibrium in a monocomponent liquid ~~as~~ vapor system. This means that, when analyzing the PDE at the level of monomer molecules and polymer-chain links, the individual macromolecule may be considered as a tiny crystal or a drop of liquid suspended in a reaction medium, i.e. as an individual-phase particle.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University)

SUBMITTED: 12Aug64

ENCL: 00

SUB CODE: MT, OC

NO REF SOV: 002

OTHER: 022

Card 2/2

L 32845-65 EWT(m)/EPF(c)/T/EPF(j) Pa.l/Pr.l RM

ACCESSION NR: AP5007571

8/0020/65/160/005/1128/1130

AUTHOR: Malinskiy, Yu. M.; Orlovskaya, T. T.; Kargin, V. A. (Academician, AN SSSR)

TITLE: Effect of the thickness of polymer films on their structure

SOURCE: AN SSSR. Doklady, v. 160, no. 5, 1965, 1128-1130

TOPIC TAGS: polymer film, gutta percha film, film thickness, supramolecular structure, polymer melt

ABSTRACT: A study has been made of the effect of the thickness of polymer films prepared from melts on the formation of secondary structures. V-shaped films (thickness, tenths of 1  $\mu$  to 30-40  $\mu$ ) were prepared under constant compressive load between a flat glass plate and a plano-convex glass lens with a very large radius of curvature. The films were heat treated, then investigated under a microscope. Most experiments were conducted with gutta-percha. The results given in the form of micrographs and a plot (see Fig. 1 of the Enclosure) indicated that the size and shape of supramolecular structures formed depend on film thickness and melt temperature; as a rule, the size of spherulites increases with film thickness and melt temperature. The smaller size of spherulites in

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L 32845-65

ACCESSION NR: AP5007571

thin films is attributed to the decreased mobility of sheaves and chains near the surface of a solid body, owing to adsorption interaction and steric hindrance. Orig. art. has: 3 figures. [B0]

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 21Oct64

ENCL: 01

SUB CODE: MT, CC

NO REF SOV: 004

OTHER: 001

ATD PRESS: 3205



Card 2/3

L 32845-65

ACCESSION NR: AP5007571

ENCLOSURE: 01

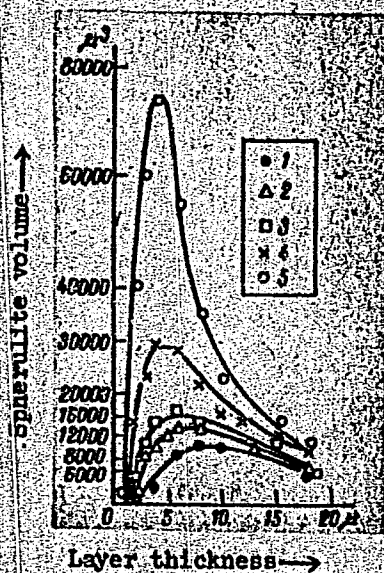


Fig. 1. Dependence of the volume of gutta-percha spherulites on the layer thickness for different initial melt temperatures

1 - 100°C; 2 - 120°C; 3 - 145°C; 4 - 200°C; 5 - 240°C.

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D 53002-65 EWT(m)/EPF(c)/ENP(j) Po-4/Pr-4 RM

ACCESSION NR: AP5010837

UR/0020/65/161/004/0867/0870

AUTHOR: Kargin, V. A. (Academician); Plate, N. A.; Kh'yeu, T.; Shibayev, V. P.

TITLE: Thermodynamic characteristics of deformation of chlorinated gutta-percha in the highly elastic state

SOURCE: AN SSSR. Doklady, v. 161, no. 4, 1965, 867-870

TOPIC TAGS: deformation, latex, natural rubber, vulcanization, chlorination, thermodynamic characteristic

ABSTRACT: Correlation between structure irregularity of gutta-percha in the highly elastic state and its mechanical behavior was studied. Samples of pure, chlorinated, and vulcanized gutta-percha were stretched at a rate of 1 mm per minute, and at 60°, 85°, 100°, and 120°C. Effect of structure irregularity was followed on the basis of changes in internal energy and entropy per unit volume and unit of elongation. The change in fusion temperature was also followed. Structure irregularity is proportional to the amount of chlorine and sulfur introduced into gutta-percha. A 100% elongation of chlorinated gutta-percha results in an increase in the

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L 53002-65

ACCESSION NR: AP5010837

internal energy and entropy. For pure gutta-percha there is a decrease in entropy during elongation. Chlorination of gutta-percha causes a slight change in the transition temperature; it is equal to  $-55^{\circ}\text{C}$  for pure gutta-percha and to  $-35^{\circ}\text{C}$  for gutta-percha containing 13.5% chlorine. Orig. art. has: 3 figures and 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 06Oct64

ENDL: 00

SUB CODE: MT, TD

NO REF SOV: 003

OTHER: 004

*Gard*  
2/2

I. 53901-65 EWI(m)/EPF(c)/EWP(j)/EWA(c)/T Pc-l/Pr-l RM

ACCESSION NR: AP5011539

UR/0020/65/161/005/1131/1134

AUTHORS: Kargin, V. A. (Academician); Kabanov, V. A.; Kargina, O. V.

TITLE: Polymerization of 4-vinylpyridine in polystyrene sulfonic acid

SOURCE: AN BSSR. Doklady, v. 161, no. 5, 1965, 1131-1134, and insert facing p. 1119

TOPIC TAGS: polymerization, polystyrene, pyridine, IR spectrum, electron microscope

ABSTRACT: The results are given of studies of the reaction of 4-vinylpyridine with a strong polymeric acid: polystyrene sulfonic acid. The acid was obtained by radiation polymerization of styrene sulfonic acid. It was found that addition of a 30% solution of polystyrene sulfonic acid in methanol to 4-vinylpyridine (molar ratio of the latter to the acid of 10:1) leads to immediate precipitation of readily solidifying sediment. The IR spectrum of the resulting product was compared with the spectra for vinylpyridine and poly-4-vinylpyridine. The band at  $926\text{ cm}^{-1}$ , belonging to deformational vibration of C-H in the vinyl group and being present in the spectrum for 4-vinylpyridine, was absent in all the

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ACCESSION NR: AP5011539

compared spectra. This indicates polymerization in the reaction. Elemental analysis of the reaction product shows 4.6% N and 10.0% S (as compared with 4.85 and 11.07%, respectively, from stoichiometric computation). The authors conclude that, despite the tenfold excess of 4-vinylpyridine, only molecules of this compound contributed to the polymerization product formed with pyrostyrole sulfonic acid. The latter is a selective polymeric activator in this reaction. By means of electron and polarizing microscopes, spiral growths were observed in the polymeric forms. It is concluded that these are due to internal stresses arising through redistribution of interatomic distances during growth of macromolecules from monomer molecules chemisorbed on the polystyrole sulfonic acid. "In conclusion, the authors express their thanks to the workers at M. M. Kusakov's laboratory for recording the IR spectra." Orig. art. has: 5 formulas and 2 figures (one of which was not with the article).

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR)

SUBMITTED: 26 Nov 64

ENCL: 00

SUB CODE: OC, GC

NO REF SOV: 001

OTHER: 000

Card 2/2

L 51703-65 EWT(1)/EWT(m)/KPF(r)/EWR(j)/T/EWC(b)-2 Pt-l/Px-l/P1-l IJP(b) 80/80  
 ACCESSION NR: AP5013449 UR/0020/65/162/001/0136/0139

AUTHOR: Papisov, I. M.; Kabanov, V. A.; Kargin, V. A. (Academician)

TITLE: Mechanism of seeding of the polymeric phase within monomer crystals

SOURCE: AN SSSR. Doklady, v. 162, no. 1, 1965, 136-139

TOPIC TAGS: solid phase, polymerization, polymer chain

ABSTRACT: An attempt was made to correlate the dimensions of the supercritical polymer seed capable of further growth with the dimensions of the individual polymer chain initiated on the active center of molecular size. This is a fundamental problem of the kinetics of solid phase polymerization. Polymer chains initiate and spread from the polymer-monomer interphase. It was assumed that the seeds of the polymeric phase have a cylindrical form and that they represent one macromolecule or a bank of parallel macromolecules. Growth of such a cylinder within the crystalline monomeric phase generates strains. The critical seed which is capable of further growth occurs when the change in free energy ( $\Delta G$ ) during its formation is equal to zero. The supercritical polymer seeds in monomer crystalline phase can be either single chains or banks of parallel chains. In practice it depends upon

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L 54703-65

ACCESSION NR: AP5013449

thermal effects and entropy of polymerization as well as upon temperature and properties of the monomer crystal lattice. Number of chains ( $x^*$ ) in the critical seed is:

$$x^* = \frac{1}{\sigma} \left( \frac{2\pi r_0 \lambda_0}{l \Delta G_0} \right)^3$$

where  $r_0$  is radius of the polymer chain,  $\sigma$  is the packing coefficient,  $\lambda_0$  is length extension of the polymer chain caused by addition of one monomer,  $l$  is length of the assumed cylindrical polymer seed,  $\Delta G_0$  is change in volume free energy during the process of addition of one monomer unit to the polymer chain. If  $x^* > 1$ , then formation of a single polymer chain in the crystalline monomer phase is thermodynamically unfavored. At a given temperature there are a definite number of unstable ( $n^*$ ) and stable ( $n$ ) polymer chains. The polymer yield ( $q$ ) is calculated from formula:

$$q = \bar{v}(n^* + n) / N_0$$

where:  $\bar{v}$  is the average number of monomer molecules which can polymerize at a given temperature, and  $N_0$  is the number of monomer molecules in a unit of volume. Orig. art. has: 2 figures and 13 formulas.

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L 54703-65  
ACCESSION NR: AF5013449

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 24 Nov 64

ENCL: 00

SUB CODE: SS, OC

NO REF SOV: 004

OTHER: 002

Card 3/3 m8

L 61657-65 EWI(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP5015426

UR/0020/55/162/004/0851/0852

30  
29  
0

AUTHOR: Kargin, V.A.; Bakeyev, N.F.; Fakirov, B. Kh. Volynskiy, A.L.

TITLE: Electron-microscopic method of studying the supramolecular structure of polymers in solutions

SOURCE: AN SSSR. Doklady, v. 162, no. 4, 1965, 851-852, and insert facing p. 852

TOPIC TAGS: electron microscopy, polybutylene, polypropylene, molecular association, polymer structure

ABSTRACT: A new method of preparing samples for electron-microscopic studies of polymer solutions is proposed. A solvent of low critical temperature (propane, ethylene, etc.) is condensed in a glass capillary containing the polymer, after which the capillary is sealed and heated 20-25C above the critical temperature. When the end of the capillary is cut off, the solution of polymer in the gaseous solvents shoots out, striking the mesh (covered with a substrate) of the electron microscope. Using this technique, the authors studied two systems: a solution of poly-s-butylene in propane, and a solution of atactic polypropylene in propane (in concentrations from 0.05 to 3 wt. %). Photomicrographs show that the formation of ordered supramolecular structures occurs even in solutions of low concentrations. As the latter increase above 3%, the polymer does not dissolve completely.

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ACCESSION NR: AP5015426

and as a result, coarse aggregates are formed which cannot be resolved by the electron microscope. Below 0.05%, the system is in a dispersed molecular state in which the size and shape of the individual molecules cannot be accurately resolved. The proposed method makes it possible to determine the character of the association of macromolecules directly in the solution. Orig. art. has: 5 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University)

SUBMITTED: 08Dec64

ENCL: 00

SUB CODE: OC

NO REF SOV: 002

OTHER: 002

Cord

2/2 jlk



L 59593-65 EWT(1)/EWT(m)/EPF(c)/T/EEC(b)-2 Pc-4/Pr-4/Pl-4 IJP(c) GG/RM

ACCESSION NR: AP5017458

UR/0020/65/162/005/1092/1094

AUTHOR: Kargin, V. A. (Academician); Sogolova, T. I.; Kurbanova, I. I.

TITLE: The problem of artificial nucleation centers for crystallizable polymers

SOURCE: AN SSSR, Doklady, v. 162, no. 5, 1965, 1092-1094, and insert facing p. 1092

TOPIC TAGS: crystallization center, polypropylene, polyethylene, polyamide, crystalline polymer, polymer structure, heavy metal salt

ABSTRACT: The effect of artificial nucleation centers (heavy-metal salts of organic acids) on the macromolecular structure of crystalline polymers (polypropylene, polyethylene, polyamide) was investigated. The size of macromolecular spheroidal aggregates was found to decrease substantially upon introduction of bismuth salicylate, titanium oxalate, or lead acetate into polypropylene and polyamide. A similar effect was observed in low- and high-density polyethylene upon introduction of copper naphthionate, titanium oxalate, bismuth salicylate, cobalt naphthionate, lead palmitate, lead acetate, lead benzoate, and zinc acetate. The introduction of these nucleation centers causes an increase in the strength and

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ACCESSION NR: AP5017458

deformability of polyethylene and polypropylene. It is concluded that by introducing heavy-metal salts of organic acids, one can control the macromolecular structure, strength, and deformability of crystalline polymers. Orig. art. has: 4 figures.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 11Jan65

ENCL: 00

SUB CODE: MT

NO REF SOV: 007

OTHER: 001

Cord

2/2

L 00932-66 EWT(1)/EWT(m)/IEPF(c)/EWP(j)/T/EEG(b)-2 IJP(c) GG/RM

ACCESSION NR: AP5021287

UR/0020/65/163/005/1194/1197

AUTHOR: Kargin, V. A. (Academician); Sogolova, T. I.; Rapoport, N. Ya.

TITLE: The mechanism of action of nuclei in crystallizing polymers

SOURCE: AN SSSR. Doklady, v. 163, no. 5, 1965, 1194-1197, and insert facing p. 1153

TOPIC TAGS: organic crystal, crystal lattice structure, crystalline polymer, catalyzed crystallization, polystyrene, supercooling seed crystal, critical crystal size, induced crystallization, supercooled polymer

ABSTRACT: It was previously shown that the introduction of high-melting substances can initiate crystallization of polymers. The purpose of this work was to determine whether any solid particle, regardless of its chemical nature, can be introduced into a polymer and serve as a crystallization nucleus. Isotactic polystyrene was used as the polymer. Metal oxides and various high-melting organic compounds were introduced as seed crystals (2% by weight). It was found that the chemical nature of the seed crystals has a significant influence on their effectiveness as crystallization initiators. Hydrophilic inorganic crystals (quartz, oxides of zinc, aluminum, vanadium, and titanium) do not initiate crystallization of polystyrene, but do so effectively in the case of hydrophilic polymers, such as polycaprolactam. Organ-

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L 00932-66

ACCESSION NR: AP5021287

ic crystals (indigo, alizarine, and 1,5-dinitroanthraquinone) initiate crystallization of isotactic polystyrene, apparently because of the better ability of polystyrene to wet their surfaces. Similarly, hydrophilic cotton fibers do not initiate crystallization of polystyrene, but become effective crystallization initiators after hydrophobization with zinc stearate. It was also found that the crystal lattice parameters of the seed crystal need not correspond to those of the crystallizing polymer. Thus the "seed crystals" are apparently not true crystallization initiators, but rather structure-forming centers which promote arrangement of polymer chains at the crystal surface into configurations favorable to incipient crystallization. This is further supported by data on the correlation of crystal-size limits and temperature. Apparently, no upper crystal-size limit exists. The lower crystal-size limits change symbatically with temperature. The results obtained suggest two effective ways of utilizing the above crystallization initiators: 1) to lower the crystallization temperature for a given melt temperature, and 2) to lower the temperature of the molten polymer for a given crystallization temperature. Orig. art. has: 1 table. [VS]

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

Card 2/3

L 00932-66

ACCESSION NR: AP5021287

SUBMITTED: 02Mar65

ENCL: 00

SUB CODE: 00, 55

NO REF SOV: 003

OTHER: 003

ATD PRESS: 4077

Card 3/3

DP

L 1625-66 EWT(1)/EWT(m)/EPF(c)/EWP(j)/T/EWA(c) IJP(c) GG/RM  
 ACCESSION NR: AP5021890 UR/0020/65/163/006/1408/1411

AUTHORS: Frolova, A. A.; Brusentsova, V. G.; Kozlov, P. V.; Kargin, V. A.  
 (Academician)

TITLE: Investigation of the relaxation phenomena in crystalline polycaprylamide

SOURCE: AN SSSR. Doklady, v. 163, no. 6, 1965, 1408-1411

TOPIC TAGS: polycaprylamide, relaxation process, crystalline polymer

ABSTRACT: Relaxation properties of crystalline polymers have been studied using specimens of polycaprylamide with a definite structure but of varying degree of crystallization. This work is a continuation of the study of relaxation processes, undertaken previously by the authors, on amorphous crystallizable polymers (DAN, 160, 875, 1965). The experimental conditions and equipment were the same as those described earlier, except that the temperature interval was now -30 to 220C and the heating rate during the thermomechanical experiments was 2C per minute. The specimens were prepared in form of tablets 10 mm in diameter and 2.3-2.4 mm thick. They were compressed at 220C and 300 kg/cm<sup>2</sup> pressure and then cooled by liquid nitrogen to -50C. Specimens so obtained were of crystalline structure (density 1.145 g/cc). Several specimens were investigated directly at

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12  
1400, 140, 14, 1.4, and 0.14 vibrations per minute. Others were heated at 180°C for 1 hour, giving a material of higher crystallization order (density of 1.153 g/cc), whose deformation was then studied at 14, 1.4, and 0.14 vibrations per minute. It was discovered that in these frequency intervals thermomechanical curves are functions of the effective force frequency. An analogy was found in properties of rigid polymers and polycaprylamide made rigid by crystallization. Study of the relaxation properties of the unheated and heated (less and more crystalline, respectively) specimens established a linear relationship between the maximal deformation values ( $\epsilon_{\max}$ ) and the logarithm of the effective force frequency, as indicated by Fig. 1 on the Enclosure. It is shown that hardening of the polymer by crystallization results in a decrease in  $\epsilon_{\max}$  value and is the cause of the increase of  $T_g$  and its independence of effective force frequency. The obtained data are explained in terms of the "bundle" structure theory offered by V. A. Kargin, A. I. Kitaygorodskiy, and G. L. Slonimskiy (Koll. Zhurn., 19 131, 1957). Orig. art. has: 3 figures.

44,55  
ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 24Mar65

ENCL: 01

SUB CODE: OC

NO REF SOV: 008

OTHER: 000

Card 2/3

L 1625-66

ACCESSION NR: AP5021890

ENCLOSURE: 01

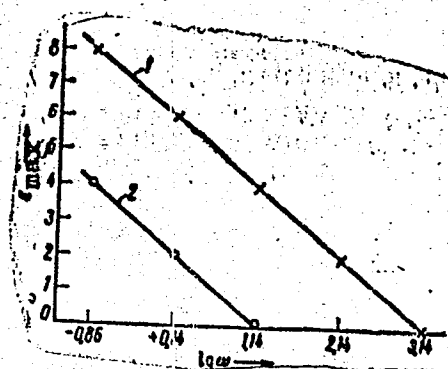


Fig. 1. Maximal deformation value (in arbitrary units) as function of the logarithm of the frequency for polycaprylamide: 1- unheated; 2- heated at 1800 for 1 hour

Card 3/3

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L 1428-66 EWT(m)/EPF(c)/EWP(j)/T RPL WW/RM UR/0020/65/164/001/0112/0114  
 ACCESSION NR: AP5023366/ 44,55 44,55  
 AUTHOR: Kargin, V. A. (Academician); Konstantinopol'skaya, M. B.; Terteryan, R. A.;  
 Berestneva, Z. Ya. 44,55 40 37 B  
 TITLE: Nature of crystalline elastic copolymers of ethylene  
 SOURCE: AN SSSR. Doklady, v. 164, no. 1, 1965, 112-114 and insert facing page 97  
 TOPIC TAGS: morphology, copolymer, crystalline polymer, elastomer, ethylene,  
 vinyl acetate  
 ABSTRACT: A study has been made of the effect of morphological forms on the prop-  
 erties of crystalline elastic copolymers. The experiments were conducted with  
 ethylene-vinyl acetate copolymers with various ratios of components. The depend-  
 ence of the crystallinity and of mechanical properties of the copolymers on vinyl  
 acetate group content was determined first. The results are given in Fig. 1 of the  
 Enclosure. An electron microscopic study of the copolymers was conducted next. It  
 was shown that in the range of the optimum mechanical properties (8-20 mol% vinyl  
 acetate groups), the copolymers contain no higher morphological forms (spherulites)  
 but only such elementary formations as fibrils and sheaves together with spherulite  
 fragments. It is suggested that the optimum elastic properties are imparted to the  
 Card 1/3

L 1128-66

ACCESSION NR: AP5023366

3  
copolymers by linear mobile structures (fibrils and sheaves) and that spherulite fragments produce a self-reinforcing effect on the system. Orig. art. has: 2 figures. [BO]

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physical Chemistry Institute)

SUBMITTED: 26Apr65

ENCL: 01

SUB CODE: 06MT

NO REF SOV: 006...

CTHER: 002

ATD PRESS: 4097

Card 2/3

Card 3/3 DP

L 42055-65 EWT(m)/EMP(j)/T Pc-1 RM

ACCESSION NR: AP5010912

UR/0286/65/000/007/0101/0102

AUTHORS: Vasilavskaya, L. P.; Bakayev, I. F.; Lagun, L. G.; Kozlov, I. V.; Kargin, V. A. 27 B

TITLE: A method for modifying the structure of polyamides and polyesters. Class 39. No. 169778 15 16

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 7, 1965, 101-102

TOPIC TAGS: polymer, polyamide, polyester, anthraquinone, pyridine, surface active substance

ABSTRACT: This Author Certificate presents a method for modifying the structure of polyamides and polyesters by adding surface-active substances to the solution or the melt of polymers. To improve the mechanical properties of the polymers, polyesters and polyamides are used as polymers, while anthraquinones and pyridines are used as the surface-active substances. The latter may be added in an amount up to 0.1%.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. Lomonosova (Moscow State University)

Card 1/2

L 112055-65

ACCESSION NR: AP5010912

SUBMITTED: 26Jun63

ENCL: 00

SUB CODE: 00, 00

NO REF SOV: 000

OTHER: 000

Card 2/2

TOPCHIEV, Aleksandr Vasil'yevich, akademik [1907-1962]; KARGIN, V.A., akademik, otv. red.; SHTERN, V.Ya., doktor khim. nauk, otv. red.; SEMENOV, N.N., akademik, red.; ZHAVORONKOV, N.M., akademik, red.; NAMETKIN, N.S., red.; SHUYKIN, N.I., red.; LIKHTENSHTYEN, Ye.S., kand. filolog. nauk, red.; KUZNETSOV, V.I., red.

[Selected works; nitration] Izbrannye trudy; nitrovanie. Moskva, Nauka, 1965. 427 p. (MIRA 18:7)

1. Chlen-korrespondent AN SSSR (for Nametkin, Shuykin).

ALAEUZHEV, P. M.; KARGIN, V.A.; TRUS', A.M.

Experimental investigation of the transmission of mechanical energy by springs with interturn pressure. Fiz.-tekhn. probl. razrab. pol. iskop. no.4:76-80 '65. (MIRA 19:1)

1. Elektrotekhnicheskii institut, Novosibirsk. Submitted Jan. 28, 1965.

L 11598-66 EWT(m)/EWP(j)/T WW/RM

ACC NR: AP6000349	SOURCE CODE: UR/0286/65/000/021/0047/0047
<p>44,55 44,55 44,55 44,55 44,55</p> <p>AUTHORS: Sedov, L. N.; Li, P. Z.; Zotov, L. I.; Akutin, M. S.; Kargin, V. A.; Krupkina, F. A.</p>	
ORG: none	50 B
<p>44,55</p> <p>TITLE: Method for obtaining elastic copolymers. Class 39, No. 176062</p>	
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 21, 1965, 47	
TOPIC TAGS: polymer, polymerization, polyester, polycondensation	
<p>ABSTRACT: This Author Certificate presents a method for obtaining elastic copolymers of unsaturated polyester resins with different monomers. To decrease shrinkage and the exothermic effect during hardening, the polyesters used are those obtained by condensation of unsaturated acids or their anhydrides with polyalkyleneglycols (e.g., with polytetramethyleneglycol) with molecular weight from 1000 to 40 000.</p>	
SUB CODE: 11/	SUBM DATE: 04May62
<p>HW</p> <p>Card 1/1</p>	

L 15327-66 EWT(m)/T/EWP(j)/ETC(m)-6 WW/JWD/RM

AEC NR: AP6000989

(A)

SOURCE CODE: UR/0286/65/000/022/0060/0060

AUTHORS: Malinskiy, Yu. M.; Trifel', B. Yu.; Kargin, V. A.

44

ORG: none

TITLE: A method for obtaining filled plastics.<sup>15</sup> Class 39, No. 176415 /announced by Scientific Research Physicochemical Institute im. L. Ya. Karpov (Nauchno-issledovatel'skiy fizhiko-khimicheskiy institut)/

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 22, 1965, 60

TOPIC TAGS: polymer, plastic, epoxy, polyester, resin.

ABSTRACT: This Author/Certificate presents a method for obtaining filled plastics, consisting of a filler and polyester maleic or epoxide binders, by applying a preliminary coating of a sizing substance to the surface of the filler. To increase the strength of the filled plastics, polyisobutylene, polychloroprene, or trifluoroacetic acid are used as sizing agents.

SUB CODE: 11/ SUBM DATE: 05Mar64

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Card 1/1

UDC: 678.046.7:678.763.2.742.4



L 27307-66 EWT(m)/EWP(j)/T/ETC(m)-6 IJP(c) WW/RM

ACC NR: AP600E979

SOURCE CODE: UR/0190/65/007/011/1946/1949

AUTHORS: Davydova, S. L.; Plate, N. A.; Yampol'skaya, M. A.; Kargin, V. A. 28  
27

ORG: Institute of Petrochemical Synthesis, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR) 28  
27

TITLE: Chemical modification of chlorinated polyolefins by introduction of aromatic groups

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1946-1949

TOPIC TAGS: polyethylene, polypropylene, aromatization, oxidative degradation

ABSTRACT: The reaction of chlorine derivatives of low and high density polyethylene, atactic and isotactic polypropylene, and toluene in the presence of aluminum chloride was investigated. This work was performed to establish the possibility of arylation of polyolefins by the interaction of chlorine derivatives of the latter with benzene derivatives in the presence of aluminum chloride. The reaction was carried out in dichloroethane and carbontetrachloride solution at 0°C. UV and IR spectra of the arylated olefins were determined, and the thermooxidative degradation of the polymers was investigated. The experimental results

Cord 1/3

UDC: 678.01:54+678.743

L 27307-66

ACC NR: AP6008979

are presented in graphs and tables (see Fig. 1).

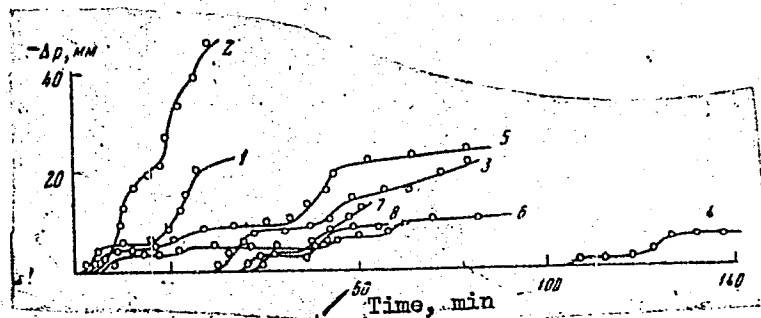


Fig. 1. Thermooxidative degradation of arylated polyolefins at an oxygen pressure of 200 mm Hg and at 200°C. 1 - polyethylene of low density; 2 - isotactic polypropylene; 3 - phenylated low density polyethylene (PE<sub>l</sub> - 52); 4 - phenylated low density polyethylene (PE<sub>l</sub> - 56); 5 - phenylated high density polyethylene (PE<sub>h</sub> - 61); 6 - phenylated atactic polypropylene (PP<sub>a</sub> - 62); 7 - phenylated isotactic polypropylene (PP<sub>i</sub> - 76); 8 - phenylated isotactic polypropylene (PP<sub>i</sub> - 77).

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L 27307-66

ACC NR: AP6008979

It was found that the arylated polyolefins have a greater resistance to thermo-oxidative degradation than the parent compounds. Orig. art. has: 1 table and 1 graph.

SUB CODE:07, 11/SUBM DATE: 25Dec64/ ORIG REF: 005/ OTH REF: 009

Card 3/3

L 46188-66 ENT(m) DS/RM

ACC NR: AP6030600 (A,N) SOURCE CODE: UR/0413/66/000/016/0092/0092

INVENTOR: Cherneva, Ye. P.; Kargin, V. A.; Tokar', Ye. G.; Tunitskiy, N. N.

ORG: none

TITLE: Preparation method for a homogeneous ion-exchange membrane.  
Class 39, No. 185052

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 92

TOPIC TAGS: ion exchange membrane, *COPOLYMERIZATION*, *SULFONIC ACID*, *ETHYLENE*, *VINYL COMPOUND*

ABSTRACT: An Author Certificate has been issued for a preparative method for a homogeneous polymeric ion exchange membrane, involving ultra-violet-initiated copolymerization of ethylenesulfonic acid derivatives with vinyl compounds, subsequent cross-linking of the copolymer, and fabrication of the film. The ethylenesulfonic acid derivative used is sodium ethylenesulfonate and the vinyl compound, acrylic acid; the components are copolymerized, the film is fabricated and then subjected to irradiation [unspecified]. [SM]

SUB CODE: 11/ SUBM DATE: 23Mar62

Card 1/1 fv

UDC: 661.183.125:678.741-134.432:011:537.591

L 27308-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AP6008975

SOURCE CODE: UR/0190/65/007/011/1927/1929

AUTHORS: Konstantinopol'skaya, M. B.; Koretskaya, T. A.; Berestneva, Z. Ya.; Kargin, V. A. 27  
BORG: Physico-Chemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)TITLE: Structure formation in regular polyamides, 5

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1927-1929

TOPIC TAGS: polymer structure, polymer nylon, electron microscopy

ABSTRACT: The present investigation is an extension of earlier published work by M. B. Konstantinopol'skaya, Z. Ya. Berestneva, and V. A. Kargin (Vysokomolek. soyed., 7, 420, 1965). The polymorphism of 6, 6-6, and 6-10 nylons was studied as a function of the temperature and nature of solvent. The form of the crystallites was determined by means of an electron microscope. It was found that, depending on the experimental conditions, two types of crystal forms were formed, viz.: plates and fibrilles. The formation of the latter was enhanced by shortening the time of secondary structure formation, e.g. rapid evaporation of solvent, addition of precipitating agent, and recrystallization of the polymer from the melt. Several electron microscope slides are presented. Orig. art. has: 12 photographs.

SUB CODE: 11/ SUBM DATE: 16Dec64/ ORIG REF: 002

Card 1/1 2

UD: 678.01:53+678.675 2

L 27309-66 EWI(m)/EWP(j)/T/ETC(m)-6 IJP(c) WW/RM  
ACC NR: AP6008976 SOURCE CODE: UR/0190/65/007/011/1930/1934

AUTHORS: Malkin, A. Ya.; Vinogradov, G. V.; Kargin, V. A.

ORG: Institute for Petrochemical Synthesis, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR) 36  
B

TITLE: Rheology of polymers. <sup>15</sup> The creep of polymers in the molten state

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1930-1934

TOPIC TAGS: polymer rheology, rheologic property, polyethylene, polyisobutylene

ABSTRACT: This investigation was conducted to extend the work of A. Ya. Malkin and G. V. Vinogradov (Kolloidn. zh., 27, 234, 1965). It was desired to determine the temperature invariant lag time distribution spectrum, to calculate theoretically the creep function, and to compare the latter with existing experimental literature data. The calculation is based on the equation presented by B. Gross (Mathematical Structure of the Theories of Viscoelasticity, Hermann, Paris, 1953)

$$\gamma(t) = \int_{-\infty}^t \frac{d\tau(\theta)}{d\theta} \left[ I_0 + \frac{t-\theta}{\eta} + \psi(t-\theta) \right] d\theta,$$

where  $I_0$  is the instantaneous yield,  $\psi$  - function of reversible creep,  $\eta$  - viscosity in the same region (where it is independent of the nature of the deformation), and  $\tau$  - the stress. Calculated values of  $\psi$  are compared with experimental values obtained

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UDC: 678.01:53

L 27309-66

ACC NR: AP6008976

for polyisobutylenes of different molecular weights and for low density polyethylene. The comparison is presented graphically. It is concluded that the experimental data are in good agreement with the calculated results. The relation between elastic and irreversible deformation in the polymer was studied. It is concluded that the boundaries of the two different deformation regions are completely determined by the maximum Newtonian viscosity of the given polymer at the experimental temperature. Orig. art. has: 2 graphs and 7 equations.

SUB CODE: 11/ SUBM DATE: 16Dec64/ ORIG REF: 005/ OTH REF: 004

Card

2/2

L 17714-66 EWP(j)/EWT(n)/T RM  
ACC NR: AP6003405 (A)

SOURCE CODE: UR/0190/66/008/001/0008/0010

AUTHORS: Paleyev, O. A.; Sheverdina, N. I.; Sogolova, T. I.; Paleyeva, I. Ye.;  
Kargin, V. A.; Kocheshkov, K. A.

ORG: Physico-Chemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Application of  $(n-C_3H_7)_2Cd$ ,  $n-C_3H_7CdCl$  and  $n-C_3H_7CdI$  in polymerization of ethylene 7.11.55

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 1, 1966, 8-10

TOPIC TAGS: polyethylene plastic, organocadmium compound, polymerization catalyst

ABSTRACT: In this work,  $(n-C_3H_7)_2Cd$  (I),  $n-C_3H_7CdCl$  (II), and  $n-C_3H_7CdI$  (III) in mixtures with  $TiCl_4$  were investigated as polymerization catalysts for propylene, substituting for the generally used organic aluminum compounds. This is an expansion of the earlier published study by the authors on organic cadmium compounds as components of mixed polymerization catalysts (Vysokomolek. soyed., 5, 846, 1963). II and III are white solids insoluble in n-hexane (solvent used in this polymerization), have poorly developed surface structure and, therefore, are

UDC: 66.095.26+678.742

Card 1/2



L 17714-66

ACC NR: AP6003405

inefficient as catalysts. I is readily soluble in organic solvents and was found to be a very effective catalyst at very low concentrations (1 g mole per 11 kg of polyethylene). The product prepared with I (softening point 137--139C) has high tensile strength (4400--4500 kg/cm<sup>2</sup>), and may serve in the preparation of strong oriented films and fibers. Orig. art. has: 1 table.

SUB CODE: 07/

SUBM DATE: 28Jan65/

ORIG REF: 004/

OTH REF: 001

Card 2/2

nst

L 24494-66 EWT(m)/EWP(j) IJF(c) RM

ACC NR: AP6006972

SOURCE CODE: UR/0190/66/008/002/0204/0206

AUTHORS: Kazhdan, M. V.; Dyumayeva, T. N.; Berestneva, S. Ya.; Kargin, V. A.

ORG: Physico-Chemical Institute Im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Investigation of the structure-formation processes occurring during rubber breakdown

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 2, 1966, 204-206

TOPIC TAGS: vulcanization, rubber, molecular structure, electron microscope

UEMB-100 electron microscope, GYeM-5U electron microscope

ABSTRACT: Structure-formation processes occurring during the breakdown of vulcanizers of noncrystallizing sodium butadiene rubbers and of crystallizing neoprenes

AC and W were investigated by electron microscopy using instruments UEMB-100 and GYeM-5 U. It was established that new orientation processes take place in disintegrated vulcanizers, leading to supramolecular structures different from those in the original rubber. The rate of structure-formation processes in disintegrated rubbers is inversely proportional to the density of the vulcanization network. The experimental data indicate that, from the structural point of view, vulcanization is a heterogeneous process. Orig. art. has: 6 figures.

SUB CODE: 07, 11/ SUBM DATE: 05Feb65/ ORIG REF: 002

Card 1/1

UDC: 678.01:53+678.43

L 32754-66 EWP(j)/EWT(m)/T LJP(c) RM

ACC NR: AP6012706

SOURCE CODE: UR/0190/66/008/004/0569/0572

AUTHOR: Zharikova, Z. F.; Reztsova, Ye. V.; Berestneva, Z. Ya.; Kargin, V. A. <sup>42</sup> <sub>B</sub>

ORG: Physicochemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: The effect of supramolecular structure in rubbers on their mechanical properties

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 4, 1966, 569-572

TOPIC TAGS: natural rubber, synthetic rubber, vulcanization, molecular structure

ABSTRACT: The dependence of the mechanical properties of structures in thiuram vulcanizates with natural rubber and synthetic polyisoprene, polybutadiene, and sodium butadiene rubbers, on its supramolecular structures was investigated. Vulcanized rubber with more ordered structure was found to possess superior mechanical properties. Change in mixing temperature (in the range of 25—70°C) does not significantly affect the structure and properties of the rubber. Structure formation in thiuram polyisoprene vulcanized rubber subjected to stretching was investigated by electron microscopy. Ribbon-like structures were found to be perpendicular to the applied force during stretching of vulcanized rubbers. Orig. art. has: 4 figures and 1 table. [NT]

SUB CODE: 11/ SUBM DATE: 05Feb65/ ORIG REF: 007/

Cord 1/1 JS

UDC: 678.021.33+678.43

L 22869-66 EWT(m)/EWP(j)/T/ETC(m)-6 WW/DJ/RM

ACC NR: AP6012709

SOURCE CODE: UR/0190/66/008/004/0645/0649

AUTHOR: Kargin, V. A.; Sogolova, T. I.; Rubshteyn, V. M.

ORG: Physicochemical Institute im L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Effect of artificial seeds on the impact toughness and wear resistance of crystallizing polymers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 4, 1966, 645-649

TOPIC TAGS: crystallizing polymer, impact toughness, wear resistance, artificial seeding, morphological form

ABSTRACT: Artificial seeding is an effective method for controlling the morphology of crystallizing polymers and improving their mechanical properties. This paper describes the results of a study of the effect of artificial seeding on the impact toughness and wear resistance of such polymers. The tests were conducted with a pendulum-hammer and a Grasselli-type machine, respectively, which were developed by the authors for testing small-size polymer specimens in a wide temperature range. The apparatuses and procedures are described in the source. The experiments were conducted with polypropylene (PP), polyamide 548 and isotactic polystyrene seeded with organic salts such as bismuth salicylate (0.5%), titanium oxalate (0.5%), or lead acetate (1%), or with indigo (2%). Study of cross sections of the original and seeded polymers showed that seeding decreased spherulite size (e.g., from 100 to 10-12  $\mu$

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UDC: 678.01:53

L22869-66

ACC NR: AP6012709



Fig. 1. Abrasion resistance of original polypropylene (1), and of polypropylene seeded with bismuth salicylate (2) or titanium oxalate (3)

in the case of PP, and resulted in uniform morphology. Seeding was shown to improve the impact toughness (e.g., from 6 to 40 kg·cm/cm<sup>2</sup> at 10C in the case of PP) and the wear resistance of the polymers. Abrasion tests were conducted with the use of a metal grate (S. B. Ratner's method), and abrasion was estimated from weight loss data. The results of abrasion tests of PP are given (see Fig. 1). Orig. art. has: 5 figures

[B0]

SUB CODE: 11/ SUBM DATE: 15Apr65/ ORIG REF: 008/ ATD PRESS: 4234

Card 212 2C

L 37085-66 EWP(j)/EWT(m)/T IJP(c) RM

ACC NR: AP6015059

SOURCE CODE: UR/0190/66/008/005/0949/0951

AUTHORS: Koretskaya, T. A.; Sogolova, T. I.; Kargin, V. A.

ORG: Physico-Chemical Institute im. L. Ya. Karpev (Fiziko-khimicheskiy institut)

TITLE: Electronmicroscopic investigation of the crystallization of polymers in the presence of artificial crystallizing agents

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 5, 1966, 949-951

TOPIC TAGS: polypropylene plastic, polyethylene plastic, electron microscopy, crystallization/ JEM-5Y electron microscope

ABSTRACT: The effect of high melting, low molecular weight additives (e.g., bismuth salicylate-I, titanium oxalate, copper naphthionate-II, zirconium oxalate-III, silica gel, etc) upon crystallization of polypropylene and high and low density polyethylene was investigated by means of electronmicroscopy. The study was performed using electron microscope JEM-5Y. The samples of crystallizing agents were introduced as suspensions into the solutions or melts of the polymers. Independently of their chemical structure, the artificial nuclei result in orientation of the polymer at the polymer-nucleus interphase and are effective when the supramolecular spherulitic and dendritic structures are formed. The structures formed in the presence of nuclei are similar in their morphology to those formed in the absence of the artificial nuclei.

Card 1/2

UDC: 678.01:53

, L 37085-66

ACC NR: AP6015059

Particles of the order of  $0.03\text{--}0.04\ \mu$  act as artificial nuclei in experiments with polypropylene and III. I and II were found to be of little effect when high density polyethylene crystallizes as monocrystals, but are quite effective when the crystallization results in spherulitic formation. Orig. art. has: 4 figures.

SUB CODE: 07/

SUBM DATE: 29May65/

ORIG REF: 007

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Card 2/2





L 40970-66

ACC NR: AP6027768

Table 1. Mechanical properties of poly(hexamethylene adipamide) with and without added novolak

Material	Tensile strength, kg/cm <sup>2</sup>		Impact strength, kg/cm <sup>2</sup>	
	after injection molding	after thermal aging	after synthe- sis	after 11-month storage
Poly(hexamethylene adipamide)	348	321	47	37
Same with 2% novolak	350	450	55	87
Same with 4% novolak	445	520	92	119
Same with 10% novolak	320	300	40	34

chemically react with the polyamide change its morphological form (spherulites). However, the novolak did affect the fine structures of the spherulites even at concentrations up to 2%, where the novolak was fully compatible with the polyamide. At above 2%, the novolak formed a separate phase consisting of amorphous particles which acted as nuclei for the formation of the spherulites. At about 4%, a stable, uniform, fine spherulite structure was formed which corresponded to optimum mechanical properties (see Table 1). [SM]

SUB CODE: 11/ SUBM DATE: 10Jun65/ ORIG REF: 003/ OTH REF: 007/ ATD PRESS: 5056  
Card 2/2mlr07/

L 00837-67 EWT(m)/EWP(j) RM

ACC NR: AP6027779 (A) SOURCE CODE: UR/0190/66/008/008/1455/1458

AUTHOR: Kargin, V. A.; Tsarevskaya, I. Yu.

30 B

ORG: Institute of Petrochemical Synthesis, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR)

TITLE: Deformation of crystalline polybutylene 1

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 8, 1966, 1455-1458

TOPIC TAGS: spherulite, polybutylene, crystalline polybutylene, material deformation, elastic deformation, structure degradation

ABSTRACT: Deformation of crystalline polybutylene was studied. It was shown that polybutylene obtains high reversible deformations in the limits of the state. Crystalline formations (spherulites) behave as a homogeneous substance the deformation of which corresponds to the deformation of the whole sample. Thus, the elastic deformation without a structure degradation could reach some 10%.

Orig: art. has: 7 figures. [Based on authors' abstract]

[NT]

SUB CODE: 07/ SUBM DATE: 10Jul65/ ORIG REF: 005/

Card 1/1 hs

UDC: 678.01:53+678.742

L 35832-66 EMP(j)/EMT(m)/T IJP(c) RM

ACC NR: AP6015730

SOURCE CODE: UR/0032/66/032/005/0609/0611

AUTHOR: Rubshteyn, V. M.; Belynskiy, V. A.; Sogolova, T. I.; Kargin, V. A.

ORG: Scientific Research Physico-Chemical Institute im. L. Ya. Karpov (Nauchno-issledovatel'skiy fiziko-khimicheskiy institut) 45

TITLE: Instruments for testing small amounts of polymer materials 44

SOURCE: Zavodskaya laboratoriya, v. 32, no. 5, 1966, 609-611 B

TOPIC TAGS: polymer structure, polymer chemistry, physical chemistry instrument, thermoplastic material, tensile strength, elongation, film processing

ABSTRACT: The article describes three newly developed instruments which are recommended for use in laboratories involved in the study of the properties and the structure of polymers over a wide temperature interval. The first is a dynamometer of the pendulum type (illustrated in the article) designed for determination of the tensile strength and the elongation limits of polymer materials over a wide temperature interval and at different rates of elongation. The initial size of the samples used is: length 10-20 mm, width 1-5 mm, thickness 0.05-0.5 mm; the volume of the minimum amount of material is 0.5 mm<sup>3</sup>, and the maximum is 50 mm<sup>3</sup>. The article gives detailed specifications of the instrument. The second development is an instrument for the elongation of wide films.

Card 1/2

UDC: 620.17:1.05

L 35832-66

ACC NR: AP6015730

With this instrument, tests can be made of the deformation of wide films of polymer material at temperatures from 20 to 250°C in an argon atmosphere. The third and final development described is a laboratory extruder designed to produce films and fibers from small quantities of thermoplastic materials. The article gives a diagram and detailed dimensions and specifications. Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: none

*ns*  
Card 2/2

KARGIN, V.A., akademik; BANEYEV, N.F.; FARBOV, O.E.; NIKANOROVA, M.I.

Structure of crystallizing polymer solutions. Dokl. AN SSSR 165  
no.3:604-606 N '65. (MIRA 13:11)

1. Moskovskiy gosudarstvennyy universitet.

L 18571-66 EWT(m)/EWP(j)/T RM

ACC NR: AP6002431

SOURCE CODE: UR/0020/65/165/005/1108/1110

AUTHORS: Kargin, V. A. (Academician); Gorina, I. I.

ORG: Institute for Petrochemical Synthesis im. A. V. Topchiyev (Institut  
neftekhimicheskogo sinteza)

TITLE: Dendritic mechanism of formation of large crystals structures in isotactic  
polypropylene 1.14.55

SOURCE: AN SSSR. Doklady, v. 165, no. 5, 1965, 1108-1110

TOPIC TAGS: polymer, polymer structure, polypropylene plastic, crystalline  
polymer/ JEM-50 electron microscope

ABSTRACT: A new type of fibrillar crystals in polypropylene was observed. This work is an extension of the investigations carried out by the authors (Vysokomolek. soyed., 7 (1965), 220, 1273, 1323). The crystals were obtained by heating a 0.01% solution of polypropylene in decaline to boiling, and by subsequent thermostating of the solution at 90C for 3--5 hours. After this treatment, droplets of the solution were investigated by electron microscopy on the JEM-50 electron-microscope. A number of electromicroscope pictures are presented. It is concluded that the

Card 1/2

UDC: 678.01:53+678.742

Z

L 18571-66

ACC NR: AP6002431

formation of spherulite crystals in polymers may follow a dendritic mechanism as well as one of the other mechanisms described by D. H. Keith and F. J. Padden, Jr. (J. appl. Phys., 34, No. 8 2409, 1963). Orig. art. has: 4 graphs. 0

SUB CODE: 20, 07, 11 SUBM DATE: 12Jun65/ ORIG REF: 002/ OTH REF: 004

Card 2/2 *SM*

L 18909-66 EWT(m)/EWP(j)/T RM

ACC NR: AP6008084

(A)

SOURCE CODE: UR/0020/66/166/005/1155/1157

AUTHOR: Kardash, G. G.; Andrianova, G. P.; Bakeyev, N. F.; Kargin, V. A. (Academician) <sup>52</sup><sub>51</sub>

ORG: Institute of Petrochemical Synthesis, Academy of Sciences, SSSR (Institut neftekhimicheskogo sinteza Akademii nauk SSSR) <sup>B</sup><sub>15.45</sub>

TITLE: Study of the characteristics of large deformations of polypropylene over a wide temperature range <sup>15</sup>

SOURCE: AN SSSR. Doklady, v. 166, no. 5, 1966, 1155-1157

TOPIC TAGS: polypropylene plastic, crystalline polymer, polymer structure, material deformation, thermal effect

ABSTRACT: In order to determine the mechanism of large deformations of crystalline polymers, the behavior of uniaxial isothermal tensile deformation and its reversibility were studied over a wide temperature range in polypropylene films containing spherulites measuring up to 80-100  $\mu$ . Microscopic and x-ray diffraction data showed that the process of stretching of the polymer at room temperature proceeds

UDC: 541.6

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L 18909-66

ACC NR: AP6008084

via deformation of the spherulites, whose individuality is retained. The mechanism of deformation at room temperature is of the type of plastic separation with some fibrillization. At higher temperatures (145°C), the deformation is associated with an abrupt change in the initial structure of the material, i. e., the fibrillization. On the basis of the results it is postulated that depending upon the conditions, the deformation of crystalline polymers may take place either at the supra-molecular level without affecting the internal structure of the crystallites, or at the molecular level via fusion and rearrangement of the initial crystal structure. As a result, the oriented materials obtained differ markedly in both structure and mechanical properties. Orig. art. has: 4 figures.

SUB CODE: 11/

SUBM DATE: 27Jul65/

ORIG REF: 007/

OTH REF: 002

Card 2/2 mc

L 26598-66 EWT(m)/EWP(j)/T RM

ACC NR: AP6009491

SOURCE CODE: UE/0020/66/167/001/0124/0127

AUTHOR: Kargin, V. A. (Academician); Kabanov, V. A.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet); Institute of Petrochemical Synthesis im. A. V. Topchiyeva AN SSSR,  
(Institut nefte-khimicheskogo sinteza, AN SSSR)

TITLE: Polymerization of complex and organized monomers

SOURCE: AN SSSR. Doklady, v. 167, no. 1, 1966, 124-127

TOPIC TAGS: polymerization, thermodynamics, chemical reaction kinetics, reaction mechanism, polymer structure

ABSTRACT: Based on literature data and the author's recent research on stereospecific polymerization, a new fundamental approach to the problem of controlling the rate and selectivity of chemical reactions has been formulated. This approach involves the creation of a strong intermolecular interaction by introduction of a new component (such as a complex-forming agent) or induction of morphological changes (e.g., crystallization) in the reaction system. When applied to polymerization, either means is potentially useful for controlling the mechanism and kinetics of the reaction, and the structure and morphology of the polymer products. Monomer complex formation, in addition, can also affect the thermodynamics of the polymerization. A particular case of monomer complex formation has biochemical implications. Orig. art. has: 2 formulas.

SUB CODE: 07  
Card 1/1

/ SUM DATE: 15Dec65 / ORIG REF: 014/CTH REF:005

CIC:541,64

L 21426-66 EWT(m)/EWP(j)/T RM/WW

ACC NR: AP6010429

SOURCE CODE: UR/0020/66/167/002/0384/0385

AUTHOR: Kargin, V. A. (Academician); Berestneva, Z. Ya.; Bogdanov, M. Ye.; Efendiyev, A. A.

ORG: Physicochemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: The problem of ordering in amorphous polymers 7.4.65

SOURCE: AN SSSR. Doklady, v. 167, no. 2, 1966, 384-385

TOPIC TAGS: amorphous copolymer, ordered structure, supramolecular structure, morphological form, globule, fibril

ABSTRACT: A study has been made of the structure of the allylbarbituric acid-acrylic acid copolymer prepared by radical copolymerization. The copolymer is amorphous and noncrystallizing by virtue of its irregular structure. However, from dilute aqueous solutions ( $10^{-1}$ — $10^{-2}$  g/100 ml; pH, 1.0) the copolymer was shown to form large ordered structures. These structures are highly oriented, exhibit marked optical anisotropy, and consist both of globular and fibrillar formations. Orig. art. has: 3 figures. [BO]

SUB CODE: 07, 11/ SUBM DATE: 02Jun65/ ORIG REF: 003/ ATD PRESS: 4221

Card 1/1 ULR

UDC: 539.213

L 10127-66 ENT(m)/EMP(j)/T EJP(c) RM

ACC NR: AP6013900

SOURCE CODE: UR/0020/66/167/006/1321/1324

AUTHOR: Kozlov, P. V.; Kaymin', I. F.; Kargin, V. A. (Academician)

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: The heat expansion mechanism in oriented linear polymers

SOURCE: AN SSSR. Doklady, v. 167, no. 6, 1966, 1321-1324

TOPIC TAGS: linear polymer, heat expansion, polymer physical chemistry

ABSTRACT: Heat related changes in the length of samples cut from isotropic cellulose triacetate film in a direction parallel or perpendicular to the axis of orientation, were analyzed to clarify the shrinking of polymers when heated. The base film was drawn out from 15 to 50% in relation to the initial length and pre-annealed in a free state (10 min, 230C). The temperature of the cut samples was raised at 2 deg/min. The results are plotted graphically and indicate that reversible shrinkage is peculiar only to oriented systems, its intensity relating to the level of orientation. The effect is characteristic for amorphous or crystalline polymers and occurs in glassy or elastic states. An interpretation of the observed phenomenon is given in terms of the amplitude of skeletal temperature vibrations. The authors express

Card 1/2

UDC: 536.413.2

ACC NR: AP5022589

SOURCE CODE: UR/0190/65/007/009/1495/1499

AUTHORS: Kargin, V. A.; Selikhova, V. I.; Markova, G. S.

TITLE: The study of the stretching and contraction processes in polyethylene films of spherulitic structures

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 9, 1965, 1495-1499

TOPIC TAGS: Polyethylene, polymer, resin, spherulite structure, polyethylene fiber / Alkaten polyethylene

ABSTRACT: The processes of stretching and contraction in polyethylene films of spherulitic structure were subjected to optical microscopy and x-ray studies. Specimens of "Alkaten" polyethylene 30  $\mu$  in thickness with spherulites of 50  $\mu$  diameter were investigated. Microphotographs of polyethylene specimens in different states of stretching are presented. The results of optical microscopy are given in Fig. 1 on the Enclosure. It was found that the deformation of spherulitic structure during stretching-contraction is reversible. The authors suggest that the orientation process may be interpreted in terms of a complete breakdown of supermolecular structure with retention of simpler structural elements. Orig. art. has: 1 graph and 13 photographs.

UDC: 678.01:53+678.742

Card 1/3

ACC NR: AP5022589

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-Chemical Institute)

SUBMITTED: 29Jul64

ENCL: 01

SUB CODE: 07

NO REF SOV: 007

OTHER: 009

Card 2/3

ACC NR: AP5022589

ENCLOSURE: 001

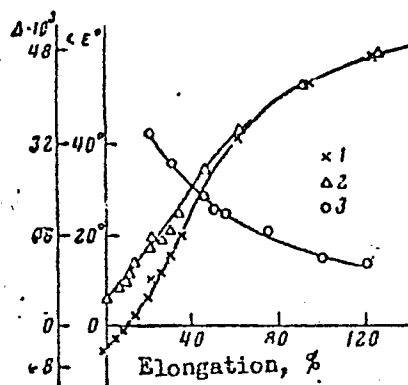


Fig. 1. Double refraction ( $\Delta$ ) and mean angle ( $\epsilon$ ) between chain and direction of stretching vs percent elongation of spherulite.

1.  $\Delta$  for radial fibrils of spherulite parallel to direction of stretching.
2. Same for fibrils perpendicular to direction of stretching.
3. Angle  $\epsilon$ .

Card 3/3

ACC NR: AP7003762 (N) SOURCE CODE: UR/0374/66/000/006/0803/0807

AUTHOR: Savkin, V. G. ; Belyy, V. A. ; Sogolova, T. I. ; Kargin, V. A.

ORG: Department of Mechanics of Polymers, AN Belorussian SSR, Gomel'  
(Otdel mekhaniki polimerov, AN Belorusskoy SSR); Physicochemical Scientific  
Research Institute im. L. Ya. Karpov, Moscow (Nauchno-issledovatel'skiy fiziko-  
khimicheskiy institut)

TITLE: The effect of supermolecular structures on the self heating of plastics  
under cyclic loading

SOURCE: Mekhanika polimerov, no. 6, 1966, 803-807

TOPIC TAGS: cyclic load, molecular structure, plastic, polycaprolactam

ABSTRACT: It has been established that the degree of self heating of poly-  
caprolactam samples subject to cyclic loading is determined by the supermolecu-  
lar structures of the samples. The larger and less homogeneous the supermolecu-  
lar structures of the cross section of the sample are, the higher is the self-heat-  
ing temperature. Cyclic loading changes the supermolecular structure and,  
therefore, the mechanical and physical properties of a sample. The introduction

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UDC: 678.5:539.43.015



ACC NR: AP7003762

of artificial nucleation centers enhances ordering and minimizing of the super-molecular structures in the polymer and contributes to lowering the self heating temperature during cyclic loading. Orig. art. has: 6 figures. [AM]

SUB CODE: 20, 11/SUBM DATE: 01Mar66/ORIG REF: 011/

Card 2/2

ACC NR: AP7003712

SOURCE CODE: UR/0190/67/009/002/0340/0344

AUTHOR: Kargina, O. V.; Ul'yanova, M. V.; Kabanov, V. A.; Kargin, V. A.

ORG: Institute of Petrochemical Synthesis im. A. V. Topchiyev, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR)

TITLE: Mechanism of polymerization of 4-vinylpyridine on macromolecular "matrices"

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 9, no. 2, 1967, 340-344

TOPIC TAGS: polymerization rate, vinyl compound, pyridine, sulfonic acid

ABSTRACT: Viscometry and UV spectroscopy were used to study the polymerization rate  $v_{pol}$  of 4-vinylpyridine (VP) in aqueous solutions of polystyrenesulfonic acid (PSSA) and polyethylenesulfonic acid (PESA), both of which served as the matrices;  $v_{pol}$  was studied as a function of the degree of neutralization of the polymeric acids  $\alpha$ . It is shown that  $v_{pol}$  increases sharply as  $\alpha$  approaches unity. On the basis of the established kinetic dependence of  $v_{pol}$  on  $\alpha$ , two possible mechanisms of polymerization of VP on PSSA and PESA are considered. Both mechanisms follow from concepts according to which there is either a possibility of a rigid fixing of VP molecules on the polymeric acids, or the presence of a sufficient mobility of VP molecules to allow migration along the chain of the macromolecular acid. The mechanism based on the second of these concepts is confirmed experimentally. Orig. art. has: 2 figures and 13 formulas.

SUB CODE: 07/ SUBM DATE: 10Oct66/ ORIG REF: 003

Card 1/1

UDC: 66.095.26:678.746

RODYAKIN, V.V.; ANDREYEV, A.Ye.; BOYKO, Yu.N.; VAYNSHTEYN, G.M.;  
KARGIN, V.M.; BRODSKIY, E.Ye.; KHABAPOVA, N.P.; TEALICH, V.S.;  
Prinimali uchastiye; PIROZHOK, Ye.V.; YURCHENKO, S.V. [deceased];  
MUNTYANOV, I.P.; SUKHORUKOVA, N.Yu.; BULANAYA, N.K.; AKHTEMENKO,  
N.Ya.; BRAGIN, A.M.

Handling of molten metallic magnesium. TSvet. met. 37 no.12.  
53-56 D '64. (MIRA 18:2)

LUKASHENKO, E.Ye.; KRAMNIK, V.Yu.; GARMATA, V.A.; SERGIYENKO, S.N.;  
Prinimali uchastiye: KARGIN, V.M., inzh.; KISELEV, O.G., inzh.;  
PETRUN'KO, A.N., inzh.; MASLENNIKOV, I.P., inzh.

Developing and mastering the method of thermochemical reduction of  
titanium tetrachloride by magnesium in retorts without inserted  
reaction sleeves. Titan i ego splavy no.6:23-26 '61. (MIRA 14:11)  
(Titanium--Metallurgy)

L 21201-65 EPA(s)-2/ENT(m)/EPF(n)-2/EPR/ENP(t)/EPA(bb)-2/ENP(b) Pad/Pt-10/Pu-4 IJP(c) JD/WW/HW/JG S/0136/64/060/012/0053/0056  
 ACCESSION NR: AP5000940

AUTHOR: Rodyakin, V.V., Andreyev, A. Ye., Boyko, Yu. N., Vaynshteyn, G.M., Kargin, V.M., Brodskiy, E. Ye., Khabarova, N.P., Tkalic, V.S.

TITLE: Transportation of liquid metallic magnesium

SOURCE: Tsvetnyye metally, no. 12, 1964, 53-56

TOPIC TAGS: liquid magnesium, liquid magnesium transport, titanium production, magnesium contamination, vacuum ladle, nickel impurity

ABSTRACT: A special vacuum ladle was designed for the transportation of liquid magnesium which protects against reaction with nitrogen and oxygen and contamination by inclusions. The metal was sampled from the electrolytic cells, from the vacuum ladle and from the reactor, which is the route the magnesium followed, and the content of O, N, Cl, Fe, Si and Ni was determined in these samples. The content of all impurities except nickel dropped during the intake and transportation of the magnesium. The quality of the magnesium deteriorated when charged into the reactor, the nitrogen and oxygen contents in the samples having increased owing to poor air-tightness of the charging unit. The content of chlorine also increased. The magnesium was contaminated with nonmetallic

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L 21201-65  
ACCESSION NR: AP5000940

inclusions mainly during the operations of sampling from the electrolytic cells and when pouring into the reducing reactors; the content of metallic impurities remained unchanged. To improve the sampling methods, and thus avoid contamination, further studies are to be directed toward excluding contact of the magnesium with the air, creation of a shielding atmosphere, and reduction of the number of operations associated with pouring the liquid magnesium from vessel to vessel. "Ye. V. Pirozhok, S. V. Yurchenko (deceased), I. P. Muntyanov, N. Yu. Sukhorukova, N. K. Bulanaya, N. Ya. Akhtemenko and A. M. Bragin also took part in the work." Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 01

SUB CODE: MM, IE

NO REF SOV: 001

OTHER: 000

Cord 2/3

ANDREYEV, A.Ye.; RODYAKIN, V.V.; VAYNSHTEYN, G.M.; KARGIN, V.M.; ERODSKIY,  
E.Ye.; BOYKO, Yu.N.; TKALICH, V.S.; KHABAROVA, N.P.

Changes in the quality of magnesium during the refining process.  
TSvet. met. 37 no.10:44-47 O '64. (MIRA 18:7)

BRUDNAYA, A.A., kand. sel'skokhoz. nauk; KUREPKO, I.A.; PAFILOVA, M. Ye, kand. biolog. nauk; KOZAR', I.M., agronom; BEZPYATYKH, A.M., agronom-entomolog; KARGIN, V.N., agronom; KUZIYEV, S., aspirant; TKHORIK, I.S.

From the practices in the use of poisonous chemicals. Zashch. rast. ot vred. i bol. 9 no.10:26-27 '64 (MIRA 18:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zerna i produktov yego pererabotki (for Brudnaya, Kurepko).
2. L'vovskiy avl'sko'hozyaystvennyy institut (for Parfilova, Kozar').
3. Bakhchisarayskoye proizvodstvennoye upravleniye (for Bezpyatykh).
4. Kolkhoz "Pobeda" (for Kargin).
5. Sredneaziat'skiy institut zashchity rasteniy (for Kuziyev).
6. Zaveduyushchiy otdelom zashchity rasteniy Yaroslavskoy opytnoy stantsii (for Tkhorik).



5.3830

25272

S/190/61/003/007/016/021  
B101/B226

11.2210

AUTHORS:

Kargin, V. V., Plate, N. A., Litvinov, I. A., Shibayev,  
V. P., Lur'ye, Ye. G.

TITLE:

Processes of polymerization and grafting on newly formed  
surfaces of inorganic substances

PERIODICAL:

Vysokomolekulyarnyye soyedineniya, v. 3, no. 7, 1961,  
1091 - 1099

TEXT: In previous papers (Vysokomolek. soyed., 1, 559, 1959; ibid., 1, 1713, 1959), the authors had shown that polymerization of vinyl monomers can be initiated by an intensive mechanical dispersion of solid inorganic substances. The present paper studies this effect when dispersing metals, metal oxides, and ionic salts. Because in the hitherto used vibration mill grindings of iron balls had a disturbing effect upon the polymerization processes, three new grinding devices have been constructed. (1) The monomer, the substance to be dispersed, and glass balls were filled into an ampul being fastened to the vibration mill. (2) The ampuls were fastened to the armature of an electromagnet which was fed

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S/190/61/003/007/016/021  
B101/B226

by a. c. (3) The ampuls were fastened to the coil of an electromagnetic 10-w loudspeaker. The use of vacuum and different temperatures was made possible by working with ampuls. Frequency was varied between 50 and 120 cps, the amplitude being 2-5 mm. Duration of dispersion amounted to 30 - 90 min. (A) Polymerization by means of  $Al_2O_3$  (corundum, energy of crystal lattice 3610 kcal/mole) or  $Cr_2O_3$  ( $E_{Cr_2O_3} = 4668$  kcal/mole) was

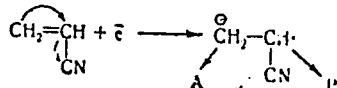
studied with styrene, methyl methacrylate, acrylonitrile, vinyl acetate, and some organic substances of the acetaldehyde type. Intensive dispersion of these oxides in the presence of styrene or methyl methacrylate led to rapid polymerization. In the case of methyl methacrylate, a polymer having a molecular weight of 25,000 was obtained. Vinyl acetate was not polymerizable. When dispersing corundum, acetaldehyde yielded, after 2 hr, 3 - 5 % polyacetaldehyde. Also in this case, the results were not different from those obtained by J. Furukawa et al. (see below) by means of  $Al_2O_3$  annealed at 600°C. Dispersion of corundum

in acetone under exclusion of air resulted, at room temperature, in small quantities of mesityl oxide and phorone. No high yields could be obtained, since the resultant  $H_2O$  is adsorbed on the surfaces of  $Al_2O_3$ .

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B101/B226

and the active centers are blocked. (B) Polymerization in the presence of Fe, Al, and Mg easily succeeded in acrylonitrile and methyl methacrylate between - 30 and + 50°C. The results did not differ from the data obtained earlier for styrene - SiO<sub>2</sub> and styrene - NaCl. Considering the polymerization mechanism of acrylonitrile, assumption is made that in the metal surface electrons are excited, which, at low work function ( $W_{Fe} = 4.31$  ev,  $W_{Al} = 4.2$  ev,  $W_{Mg} = 2.74$  ev) pass over to the monomer adsorbed on the metal surface, and release the reaction according to the following scheme:



A denotes the possibility of chain growth according to anionic mechanism, P according to radical mechanism. Besides, in the presence of Fe, complex formation of Fe with nitrile groups and formation of cyclic groups is assumed for acrylonitrile. Furthermore, account has to be taken of that the metals are covered by an oxide film. On the oxide film, a grafting of the resulting polymer could appear, and separation of the Me-O bonds during

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Processes of polymerization ... 25272 S/190/61/003/007/016/021  
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dispersion also could have an initiating effect. In the system Mg-methyl methacrylate, a highly swelling polymer was obtained, a metal-polymer gel, the lattice points of which consist of metal particles being bound to the polymethyl methacrylate by means of Me-O-C bonds. When treating these polymers with HCl, the molecular weight decreased (from 74,000 to 30,000 in the system with Al; from 250,000 to 160,000 in the system with Mg). Therefrom, conclusion is drawn that a hydrolysis of Me-O-C bonds had taken place. Attempts to polymerize styrene or methyl methacrylate by dispersing metallic Cr or W were unsuccessful. The too high work function of these metals is considered to be the cause of this fact. The capability of initiating polymerization thus does not depend on the absolute strength of interatomic bonds in the crystal, but on the capability of forming active centers of the electron donor- or radical type. (C) Polymerization by dispersion of salts (NaCl, KCl, CaF<sub>2</sub>) already took place at room temperature in methyl methacrylate, acrylonitrile, styrene, and  $\alpha$ -methyl styrene. Assumption is made that also in this case initiation takes place by transferring an electron to the monomer. The electron might be set free by ionization- or crystal defects of the F-center type. Dispersion of TiCl<sub>3</sub> or BeCl<sub>2</sub> in the presence of styrene led to its rapid

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B 01/B226

polymerization, even at  $-60^{\circ}\text{C}$ . These salts had no effect upon methyl methacrylate. In this case, the initiation of the polarizing effect of  $\text{Ti}^{3+}$  or  $\text{Ce}^{3+}$  is reduced to the double bond of styrene tending toward cationic polymerization. In agreement with the experiment, monomers with electronegative substituents (methyl methacrylate) could not be polymerized. S. D. Levina, K. P. Lebanova, P. Yu. Butvagin, A. A. Berlin, K. S. Minsker and V. K. Bykhovskiy are mentioned. There are 3 figures and 21 references: 10 Soviet-bloc and 11 non-Soviet-bloc. The three most important references to English language publications are as follows: J. Furukawa, T. Saegusa, T. Tsuruta, H. Fujii, T. Tsuruta, J. Polymer Sci., 36, 546, 1959; H. Atkins, A. Kraus, J. Amer. Chem. Soc., 41, 389, 1923; M. Ueta, W. Kanzig, Phys. Rev., 21, 326, 1954; 21, 339, 1955.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova  
(Moscow State University named M. V. Lomonosov)

SUBMITTED: November 19, 1960

Card 5/5

*Kargin, Yu.M.*  
USSR/Electrochemistry

B-12

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26327

Author : V.F. Toropova, R.Sh. Nigmatullin, Yu.M. Kargin

Inst : Kazan University

Title : To the Question of Application of Oscillo-Polarographic Method to Study of Complex Ions.

Orig Pub : Uch. zap, Kazansk. un-ta, 1956, 116, No 5, 108-112

Abstract : The reversibility (RZhKhim, 1957, 3946) of reduction of  $\text{Cd}^{2+}$  and  $\text{Zn}^{2+}$  in non-complex ( $\text{NaNO}_3$ ) and complex solutions was studied by the oscillo-polarographic method with sinusoidal voltage at  $18^\circ$  and constant ion strength of solution, which was maintained equal to 1 by addition of  $\text{NaNO}_3$ . The degree of irreversibility was judged by the magnitude of the deviation of the experimental value of  $\Delta E_p$  (potential differences between the peaks of the anode and the cathode waves) from the theoretical corresponding to a reversible process, and  $\Delta E_p$  was determined at this occasion at various speeds of the potential changes ( $\alpha$ ) and extrapolated to the value of  $\alpha = 0.005$  v per sec, which corresponded to the conditions of usual polarography. It was shown that the reduction of

Card : 1/2

ACC NR: AP7011353

SOURCE CODE: UR/0062/66/000/011/1902/1907

AUTHOR: Kargin, Yu. M.; Nikonorov, K. V.

ORG: Institute of Organic Chemistry, Academy of Sciences USSR, Kazan'  
(Institut organicheskoy khimii AN SSSR)

TITLE: On the Mechanism of the reduction of O,O-dimethyl-2,2,2-trichloro-1-hydroxyethylphosphinate on a dropping mercury electrode

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 11, 1966, 1902-1907

TOPIC TAGS: chemical reduction, chopping electrode, electrode reaction, chlorinated organic compound, organic phosphorus compound

SUB CODE: 07

ABSTRACT: The mechanism of the reduction of chlorophos (O,O-dimethyl-2,2,2-trichloro-1-hydroxyethyl-phosphinate) was studied to determine the nature of the limiting current, whether or not the total electrode process is reversible, how many electrons and protons participate in the electrode reaction, whether or not protons participate in the potential determining step, what group in the molecule is reactive, and what product is obtained. The overall scheme of the electrode process in the reduction of chlorophos on a dropping mercury electrode was established. It was hypothesized that the electrode reaction is a two-step process: two-electron cleavage of the C-Cl bond with the addition of one proton and the re-

Card 1/2  
UDC: 541.124 + 541.13 + 542.941 + 661.718.1

0931 1731

ACC NR: AP7011353

moval of a chloride anion. The most probable site of the molecule subjected to attack by the electron should be the carbon atom of the trichloromethyl group. This was confirmed experimentally. The first step of the electrode reaction was characterized on the basis of the theory of irreversible waves. The heat of activation characterizing the first step was found to be 12.9 kcal/mole. V. I. Sannikova and I. B. Karimova took part in the experimental work. Orig. art. has: 5 figures and 2 formulas. [JPRS: 40,351]

Card 2/2



KARGIN, YU. M.

YU. M. KARGIN

5(0)

## PAGE 1 BOOK EVALUATION

SOV/2019

Kazam. Khimiko-tekhnologicheskii Institut imeni S.M. Kirova

Trudy, 77p. 22, Khimicheskiye nauki (Transactions of the Chemical and Technological Institute imeni S.M. Kirov, Kazan. 1979. 22, Chemical Sciences) Kazan', 1979.

175 p. Irregularly issued. 300 copies printed.

Editorial Board: I.M. Kochalov (Resp. Ed.) Professor, A.A. Trifunov, (Resp. Ed.) Professor, I. Ye. Moysak (Deputy Resp. Ed.) Professor, G.S. Vozdvizhenskiy, Professor, A. Ye. Armanov, Academician, Dn. N. Mankin, Professor, S.M. Kochergin, Professor, A.M. Prigor'ye, Professor, N.A. Dolgov, Professor, Dn. A. Kartalov (Resp. Secretary) Doctor, Ed.: Ye. Karyev, Tech. Ed.: I. Kh. Leymlin.

PURPOSE: This book is intended for industrial chemists, technologists, scientists, teachers, and research students in applied chemistry.

CONTENTS: The collection contains reports by faculty members of the sponsoring institute and also commemorates the 75th anniversary of the birth and first anniversary of the death of Professor Aleksey Mikhaylovich Vasil'yev, Doctor of Chemical Sciences and head of the Faculty. A review of Vasil'yev's scientific activities is given along with a chronological bibliography of his published works and that of members of the Institute under his leadership. Articles of the collection deal mainly with electrochemistry and the analysis of electrochemical processes, chemical analyses, investigations of the prospective application of physicochemical phenomena in industrial processes, e.g., cleansing with ultrasound, enhancing the properties of building materials with additives, etc. References are given at the end of each article.

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5(4)

AUTHOR: Kargin, Yu. M.

SOV/32-25-3-5/62

TITLE: Determination of Small Concentrations According to the Method of Oscillographic Differential Polarography (Opredeleniye malykh kontsentratsiy metodom raznostnoy ostsillograficheskoy polyarografii)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 273 - 276 (USSR)

ABSTRACT: The principle of the method is a simultaneous electrolysis of two equal solutions one of which containing the substance to be determined (Refs 1, 2). A quantitative method of determining small amounts of Cd, Pb, Bi, and Zn at their simultaneous presence was devised according to the above method by using a unit which was controlled according to data of references 1 and 2 (Figs 1, 2). The unit was tested by using a mixture of 1-molar solutions of ammonia and ammonium chloride which contained  $10^{-4}$  g-Ion/l Cd. The oscillographic differential polarogram is given (Fig 3). Experiments on the influence of dissolved oxygen have shown that at a high acidity of the

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Determination of Small Concentrations According to the SOV/32-25-3-5/62  
Method of Oscillographic Differential Polarography

solution no deformation of the oscillograms takes place in the presence of buffer additions or complex formers. According to the theory (Refs 5, 6) the current intensity showed a linear dependence on the ionic concentration (of the above-mentioned ions) (Fig 5) in the presence of oxygen with the exception of  $5 \cdot 10^{-6}$  -  $1 \cdot 10^{-6}$  m ionic concentration where a deviation of 5 - 8% approximately was observed. The effect of a difference in the concentration of ammonia, ammonium chloride, and hydrochloric acid on the shape and height of the polarographic wave of cadmium were investigated (Table 1) as well as the effect of an addition of sodium nitrate to the first cell. The determination of Cd, Pb, Bi, and Zn from their mixture was carried out according to the method of the additions. Cd and Pb were determined from 1 m HCl, Bi from 0.4 m acetic acid + 0.4m sodium acetate + 0.01 m Trilon and Zn from 1 m  $\text{NH}_4\text{OH}$  + 1 m  $\text{NH}_4\text{Cl}$  + 0.1 m  $\text{KNaC}_4\text{H}_4\text{O}_6$ . There are 5 figures, 2 tables, and 6 references, 3 of which are Soviet. Kazanskiy gosudarstvennyy universitet (Kazan' State University)

ASSOCIATION:  
Card 2/2

KARGIN, Yu.M.; BERDNIKOV, Ye.A.

Use of a stationary mercury electrode for microanalytical  
determinations. Zav.lab. 26 no.9:1078-1079 '60. (MIRA 13:9)

1. Kazanskiy gosudarstvennyy universitet.  
(Electrodes, Mercury) (Microchemistry)

ACCESSION NR: AR3000537

S/0081/63/000/007/0117/0118

SOURCE: RZh. Khimiya, Abs. 7656

AUTHOR: Kargin, Yu. M.

TITLE: Determination of low concentrations of some metal ions by the method of differential oscillographic polarography

CITED SOURCE: Teoriya i praktika polyarogr. analiza. Kishinev, Shtiintsa, 1962, 243-247

TOPIC TAGS: differential oscillographic polarography; determination of Cu, Sb, Cd, Zn ions

TRANSLATION: A method has been developed for determining small amounts of Cu and Sb by difmferential oscillographic polarography in 0.4 M acetic acid + 0.4 M Na-acetate + 0.01 M Complexon III. Height of the waves of Cu sup 2+ and Sb sup 3+ is proportional to their concentrations in the range  $10 \text{ sup } -4$  to  $10 \text{ sup } -6$  gram-ion/liter, determination error less

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KARGIN, Yu.M.

New methods of polarography (survey). Zav. lab. 28 no.9:  
1029-1036 '62. (MIRA 16:6)  
(Polarography)

PASHCHENKO, A.I.; SONGINA, O.A.; KARGINA, N.I.

Amperometric titration of gold with thiourea. Zav. lab. 31 no.11:  
1312-1314 '65. (MIRA 19:1)

1. Kazanskiy gosudarstvennyy universitet.

ACCESSION NR: AP4041763

S/0076/64/038/006/1677/1679

AUTHOR: Kochergin, S. M.; Kargina, N. M.

TITLE: A comparative study of the texture of electrodeposited silver.

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 6, 1964, 1677-1679

TOPIC TAGS: silver, electroplating, metallography, electron microscopy, silver plating, surface property

ABSTRACT: Because silver compounds display semiconductor properties silver and its compounds began to attract a great deal of attention. The purpose of this work was to expand our knowledge of this field of interest. The obtained results may help the interpretation of the surface properties of silver. The electrolytic deposits of silver were obtained in a 200 cm<sup>3</sup> electrolyzer on copper foil cathodes, silver plated in some cases. The thickness of the deposit was 25 - 50 microns. The surface structure was investigated by electron microscopy and the texture -- by means of x-ray diffraction. Grain sizes were calculated from the x-ray diffraction patterns and were compared with the electron microscopy data. The texture was formed along the  $[011]$  and  $[111]$  axis. Very often silver deposits had no preferred

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ACCESSION NR: AP4041763

grain orientation. The electrolytic deposits from different electrolytes differ in grain size. Variations in grain sizes are also observed within one deposit. The mutual orientation of grains in silver deposits was small. The large nonuniformity of grains may be the cause of the significant nonuniformity of the properties of silver deposits. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskii institut (Kazan' Institute of Chemical Technology)

SUBMITTED: 11Jul63

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 007

OTHER: 004

Card 2/2



ACC NR: AP7003712

SOURCE CODE: UR/0190/67/009/002/0340/0344

AUTHOR: Kargina, O. V.; Ul'yanova, M. V.; Kabanov, V. A.; Kargin, V. A.

ORG: Instituto of Petrochemical Synthesis im. A. V. Topchiyev, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR)

TITLE: Mechanism of polymerization of 4-vinylpyridine on macromolecular "matrices"

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 9, no. 2, 1967, 340-344

TOPIC TAGS: polymerization rate, vinyl compound, pyridine, sulfonic acid

ABSTRACT: Viscometry and UV spectroscopy were used to study the polymerization rate  $v_{pol}$  of 4-vinylpyridine (VP) in aqueous solutions of polystyrenesulfonic acid (PSSA) and polyethylenesulfonic acid (PESA), both of which served as the matrices;  $v_{pol}$  was studied as a function of the degree of neutralization of the polymeric acids  $\alpha$ . It is shown that  $v_{pol}$  increases sharply as  $\alpha$  approaches unity. On the basis of the established kinetic dependence of  $v_{pol}$  on  $\alpha$ , two possible mechanisms of polymerization of VP on PSSA and PESA are considered. Both mechanisms follow from concepts according to which there is either a possibility of a rigid fixing of VP molecules on the polymeric acids, or the presence of a sufficient mobility of VP molecules to allow migration along the chain of the macromolecular acid. The mechanism based on the second of these concepts is confirmed experimentally. Orig. art. has: 2 figures and 13 formulas.

SUB CODE: 07/ SUBM DATE: 10Oct66/ ORIG REF: 003

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UDC: 66.095.26:678.746

KARGIN, V.A., akademik; KABANGV, V.A.; KARGINA, O.V.

Preparation and study of the catalytic properties of high-molecular weight polystyrene sulfonic acid. Dokl. AN SSSR 153 no.4:845-847 D '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

L 53901-65 EWT(m)/EPT(c)/EWP(j)/EWA(c)/T Po-l/Pr-l RM

ACCESSION NR: AP5011539

UR/0020/65/161/005/1131/1134

AUTHORS: Kargin, V. A. (Academician); Kabanov, V. A.; Kargina, O. V.

TITLE: Polymerization of 4-vinylpyridine in polystyrole sulfonic acid

SOURCE: AN SSSR, Doklady, v. 161, no. 5, 1965, 1131-1134, and insert facing p. 1119

TOPIC TAGS: polymerization, polystyrole, pyridine, IR spectrum, electron microscope

ABSTRACT: The results are given of studies of the reaction of 4-vinylpyridine with a strong polymeric acid: polystyrole sulfonic acid. The acid was obtained by radiation polymerization of styrole sulfonic acid. It was found that addition of a 30% solution of polystyrole sulfonic acid in methanol to 4-vinylpyridine (molar ratio of the latter to the acid of 10:1) leads to immediate precipitation of readily solidifying sediment. The IR spectrum of the resulting product was compared with the spectra for vinylpyridine and poly-4-vinylpyridine. The band at  $926\text{ cm}^{-1}$ , belonging to deformational vibration of C-1 in the vinyl group and being present in the spectrum for 4-vinylpyridine, was absent in all the

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